

## PATENT ABSTRACTS OF JAPAN

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## (54) FAT AND OIL COMPOSITION

## (57)Abstract:

PROBLEM TO BE SOLVED: To provide a highly safe fat and oil composition which causes little accumulation of body fat, has usefulness in cooking equivalent to that of a common edible oil, and has a good flavor.

SOLUTION: Provided is a fat and oil composition mainly consisting of triglycerides, wherein the rate of medium-chain fatty acids account for 5-23 mass % of all the fatty acids that constitute the composition, and the rate of triglycerides having two medium-chain fatty acid residues in the molecule is 1-20 mass %. It is desirable that the medium-chain fatty acids are 6-12C saturated fatty acids, and that the rate of triglycerides having three medium-chain fatty acid residues in the molecule is at most 3 mass %.

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[in(2)]

in 1]An oil and fat composition which mainly consists of triglyceride, and a rate of medium  
n fatty acid occupied to total fatty acid which constitutes an oil and fat composition by 5 ~ 23  
e %. And an oil and fat composition, wherein a rate of triglyceride occupy to all the triglyceride of  
ng two medium-chain-fatty-acid residue in intramolecular is one to 20 mass %.

in 2]The oil and fat composition according to claim 1 whose medium chain fatty acid is saturated  
/ acid of the carbon numbers 6-12.

in 3]The oil and fat composition according to claim 1 or 2 whose rate of triglyceride occupy to all  
triglyceride which constitutes an oil and fat composition of having three medium-chain-fatty-acid  
due in intramolecular is below 3 mass %.

in 4]The oil and fat composition according to any one of claims 1 to 3 whose rate of long chain  
inter fatty acid occupied to overall-length chain fatty acid which constitutes an oil and fat  
position is below 20 mass %.

in 5]All as an emulsifier at least one sort chosen from sucrose fatty acid ester and polyglycerol  
s acid ester to this oil and fat composition 0.1 to 3 mass %. Sucrose acid monoglyceride 0.01 to 2  
s acid ester to this oil and fat composition 0.1 to 3 mass %. And at least one sort chosen from  
e at least one sort chosen from diglyceride, caprylic fatty acid and caprylic fatty acid  
r contain so that a total amount of 0.1 to 3 mass % and this emulsifier may become 0.3 ~ 5 mass

in 6]An oil and fat composition for cooking containing the oil and fat composition according to  
one of claims 1 to 5.

relation done.]



oil and fat composition of having three medium-chain-fatty-acid residue in intramolecular is below 1 mass %, it is still more preferred that it is below 2 mass %, and it is further more preferred that it is below 3 mass %. When this ratio exceeds 3 mass %, emitting smoke and foaming increase at time of cooking and it is thus being suitable as fat and oil for fries. Emitting smoke and an overment making to foaming are considered for this rate to be below 1 mass %. It is preferred that rate of the long chain saturated fatty acid occupied to the overall-length chain fatty acid which is below 15 mass % is 10 mass % or less. When this ratio exceeds 10 mass %, it is still more preferred that it is below 15 mass %, and it is further more preferred that it is below 20 mass %. Since the saturated fatty acid percentage will fall and crystallization of fat and oil will come to be slowed at by the oil and fat composition if this rate exceeds 20 mass %, it is also being suitable for raw edible ones.

1015 After this oil and fat composition with little body fat accumulation of this invention mixes ably the fat and oil and medium-chain fatty acid as a raw material. An ester exchange reaction formed under existence of a lipolytic enzyme by making sodium methylate into a catalyst, under present circumstances, the medium-chain fatty acid occupied to the total fatty acid which is alkane constitutes an oil and fat composition — comparatively — and it can obtain by adjusting an ester interchange reaction so that the rate of triglyceride occupy to all the triglyceride of having two medium-chain-fatty-acid residue in intramolecular may order in said specific ranges. In addition to above-mentioned adjustment, on the occasion of the above-mentioned ester exchange reaction, to all the triglyceride which constitutes an oil and fat composition. The triglyceride which it is in intramolecular comparatively medium-chain-fatty-acid residue and/or, by adjusting so, the rate of the long chain saturated fatty acid occupied to the overall-length chain fatty acid is constitutes an oil and fat composition may enter in said specific ranges. The oil and fat composition where has little body fat accumulation and the emitted smoke at the time of fry and cooking are being improved. For example, to be used as a raw material, can be used as follows. 1020 As petroleum stock fat, sunflower oil and fat, for example, soybean oil, plum rape, high oleic acid sunflower oil, sunflower oil, sesame vegetable oil, a bedstead oil, plum rape, high oleic acid sunflower oil, high oleic acid macadamia-nuts oil, hazelnut oil, high oleic acid sunflower seed oil, cottonseed cake oil. Grape seed oil, a macadamia-nuts oil, sunflower seed oil, Japanese pumpkin seed oil, corn oil, camelina oil, tea seed oil, sesame oil, a BORAJ oil, olive oil, rice bran oil. A wheat germ oil, palm oil, palm kernel oil, palm oil, cacao oil, beef tallow, lard, chicken fat, milk fat, fish oil, seal oil, e oils, these fats and oils type-saturated — by quality improvement and these hydrogenated oils, judgment fats and oils, etc. are mentioned.

1025 Although medium-chain fatty acid was already described, it can replace with medium chain fatty acid, or medium-chain-fatty-acid triglyceride can also be used with this. Although the reaction produced by giving said medium-chain fatty acid and glycerin to an esterification reaction is a conventional method can be used as medium-chain-fatty-acid triglyceride. Generally are used MCT (Medium Chain Triglyceride). The single acid radical in which the carbon number of palm oil fat fatty acid, coconut saturated fatty acid of 8-10, or mixed acid group triglyceride, for example, triglyceride of caprylic acid capric acid = 80 / 10-19 (25 mass ratio), can use it.

1030 Once to the rate and all the triglyceride of the medium chain fatty acid occupied to two fatty acid which constitutes an oil and fat composition. The case of the triglyceride which has medium-chain-fatty-acid residue in intramolecular of being conservatively required. The triglyceride which it has three in intramolecular the medium-chain-fatty-acid residue occupied to all saturated fatty acid occupied to the overall-length chain fatty acid which constitutes the oil fat composition in the case of being required takes a petroleum stock fat presentation into consideration, adjusts the use rate of petroleum stock fat and medium chain fatty acid and can be by measuring the triglyceride composition of the resultant under ester exchange reaction. 1035 When performing the water exchange reaction which makes sodium methylate a catalyst, sodium stearic fat and medium-chain-fatty-acid triglyceride are mixed by mass-ratio = 7:1 / 29-34, and the gas ingredient and moisture which are contained in a raw material exchange is dried. Sodium methylate 0.02-0.15 mass % are added to this, and an ester exchange reaction is carried by stirring at 80-120 °C for 10 to 60 minutes under ordinary pressure and a nitrogen air

current, or decompression of 10 or less mmHg. Completion of a reaction is checked by measuring the triglyceride composition of a resultant with gas chromatography. The stop of a reaction is performed by adding water to a resultant or adding acid, such as phosphoric acid. Then, sufficient rinsing to remove a catalyst and superfluous acid is performed, and a resultant is decolorized and deodorized with a conventional method after deaeration.

1040 When performing an ester exchange reaction using a lipolytic enzyme, petroleum stock fat, medium-chain fatty acid, or medium-chain-fatty-acid triglyceride is mixed by mass-ratio = 7:1 / 29-34 of the fat and oil, and the reaction temperature is carried out to be 60-120 °C. The reaction time is ratio of 40-100 s which is the reaction temperature fully depends. A lipolytic enzyme is added at a rate of 0.005-10 mass % to a raw material mixture to this, and an ester exchange reaction is performed in 2 to 48 hours. As for this reaction, it is desirable under ordinary pressure to carry out in a nitrogen gas. Completion of a reaction is checked by measuring the triglyceride composition of a resultant with gas chromatography. The stop of a reaction is performed by removing an enzyme by filtration. A resultant is decolorized and deodorized with a conventional method after rinsing and deaeration. When medium chain fatty acid is used, free fatty acid is removed by the thin film type evaporator after the stop of a reaction. The rate of triglyceride of having three medium-chain fatty acid residue in intramolecular of the ester exchange reaction using a lipolytic enzyme is insufficient increases. Although there is the feature that the oil and fat composition with many rates of triglyceride of having three medium-chain-fatty-acid residue in intramolecular has little body fat accumulation, at the time of continuous fry cooking, emitting smoke and foaming happen violently and are not preferred. As a lipolytic enzyme, although those of *Asiaticoccus*, the *Candida* group, *Rhizopus*, a *Mucor*, or the *Pseudomonas* origin, the phospholipase A or of fatty origin, etc. are mentioned, the *Asiaticoccus* group of the *Rhizopus* origin is especially preferred.

1045 The reaction condition can also be adjusted from the vegetation where the reaction was improved so that the oil and fat composition can be a lean, or olive, a flax seed, or sunflower, a camelina, a cottonseed, a corn, a coconut, a palm, an olive, a flax seed, or sunflower.

1050 FV fitness, especially foaming control can be further raised by making the oil and fat composition of this invention contain an emulsifier. As an emulsifier, sucrose fatty acid ester, polyglyceryl fatty acid ester, succinic acid monoglyceride, monoglyceride, diglyceride, sorbitol fatty acid ester, a sorbitan fatty acid ester, etc. are mentioned. In this invention, at least one sort of the above-mentioned emulsifier can be chosen, and 0.1-8 mass % of the addition to an oil and fat composition is 0.3 to 3 mass % desirable still more preferably as the whole emulsifier. Although sucrose fatty acid ester includes the saturation of sucrose and the carbon numbers 6-22, or ester with unsaturated fatty acid. The degree of average substitution of all the hydroxy groups is 3.75 to 8.75%, and it is preferred that the ratio of polyol ester more than the treater occupied to all the sucrose fatty acid ester is more than 85 mass %. Although polyglyceryl fatty acid ester includes polyglycerol to decalcohol, the saturation of the carbon numbers 6-22, or ester with unsaturated fatty acid preferably above triglyceride. It is preferred that the degree of average substitution of all the hydroxy groups is 1 to 100%. Monoglyceride is formed under monoglyceride and diglyceride include the fatty acid and diester, monoglyceride, or diglyceride by 3:1 to 0.1:1 is preferred. Sorbitol fatty acid ester and diester, monoglyceride, or diglyceride by 3:1 to 0.1:1 is preferred. Sorbitol fatty acid ester and a sorbitan fatty acid ester have mono- [the degree of sorbitol or sorbitan, and the carbon numbers 6-22, or / with unsaturated fatty acid] - preferred triester. As the saturation of the carbon numbers 6-22, or an example of unsaturated fatty acid, the being guided as an example of medium chain fatty acid and long chain fatty acid is mentioned above.

1055 [007]About combination use of an emulsifier, the oil and fat composition of this invention is received. At least one sort chosen from: sucrose fatty acid ester and polyglyceryl fatty acid ester 0.1 to 3 mass %. Succinic acid monoglyceride 0.01 to 2 mass %, and monoglyceride. At least one sort chosen from: diglyceride, sorbitol fatty acid ester, and a sorbitan fatty acid ester so that the total amount of 0.1 to 3 mass % and this emulsifier may become 0.3-8 mass %. Since it is the further improvement in fry fitness, especially foaming control to make it oil and fat composition, it is the most desirable.

1060 The oil and fat composition of this invention produced by performing it above can blend the





